

REMARKS

Claims 1 and 3-12 are pending in this application. Claims 3-12 have been withdrawn from consideration.

I. Rejection Under 35 U.S.C. §103

The Office Action rejects claim 1 under 35 U.S.C. §103(a) over U.S. Patent No. 5,834,140 to Wolski et al. ("Wolski"). Applicants respectfully traverse the rejection.

Claim 1 recites, "An electrodeposited copper foil with low roughness surface, wherein surface roughness (Rz) is 2.0 μm or less, surface uniformity is provided with degree of mirror gloss of the roughness surface, measured by Gs (85°) in accordance with JIS (Japanese Industrial Standard) Z8741 is 100 or more and low roughness without uneven surge, and a percent elongation is 10.0% or higher at 180°C." Applicants respectfully assert that Wolski would not have rendered obvious each and every feature of claim 1.

The Office Action asserts that Wolski discloses a copper foil with a matte side that has a surface roughness (Rz) of from 0.5 to 2.1 μm and an elongation of 18.6 to 19.5 % at 180°C. However, the Office Action acknowledges that Wolski does not disclose that the foil has "surface uniformity is provided with degree of mirror gloss of the roughness surface, measured by Gs (85°) in accordance with JIS (Japanese Industrial Standard) Z 8741 is 100 or more," as recited in claim 1. Rather, the Office Action asserts that because the copper foil disclosed in Wolski allegedly has a similar Rz value and the percent elongation as recited in claim 1, the copper foil disclosed by Wolski would inherently possess the mirror gloss recited in claim 1. Applicants respectfully disagree.

As previously argued, there is not necessarily a correlation between surface roughness (Rz) and surface uniformity (Gs). The surface uniformity measurement (Gs) conducted by Applicants measures concave and convex portions of the foil over a very small interval of 10 to 100 μm , while the surface roughness measurement (Rz) measures the average undulation over a

4 mm interval. Therefore, if over a 4 mm interval, the foil has 10 concave convex undulations of 2.0 μm each, the average undulation over the 4 mm interval may be the same as a foil that has only one convex undulation over the same 4 mm interval. However, the difference in the number of undulations can be detected over a 10 or 100 μm interval and, thus, would be reflected in the Gs measurement but not in a Rz measurement. Please see the Request for Reconsideration filed November 17, 2008 for more details regarding the above argument.

Therefore, Applicants respectfully assert that merely because the copper foil of Wolski allegedly has a similar Rz and elongation as recited in claim 1, it would not necessarily have degree of mirror gloss of roughness surface (Gs) as recited in claim 1.

In further support of this argument, Applicants submit the attached Declaration Under 37 C.F.R. §1.132 (Declaration). In the Declaration, electrodeposited copper foils were prepared in accordance with examples 1-4 of Wolski. These electrodeposited copper foils were then tested for degree of mirror gloss of surface roughness (Gs), roughness surface and gloss surface in the same manner that the examples and comparative examples in the present specification were tested. As can be seen in Table 1 of the attached Declaration, all of the samples of Wolski have a degree of mirror gloss of roughness surface Gs (85°) of between 50 and 95, all of which are below the value of 100 or more, as recited in claim 1. Thus, Applicants respectfully assert that the foils of Wolski do not have at least the degree of mirror gloss of the roughness surface as recited in claim 1.

As shown in the attached Declaration, example 1 of Wolski has the highest degree of mirror gloss of roughness surface Gs, which is 95. This example does not use Zeratin in its electrolyte solution, but Zeratin is commonly used in electrodeposited copper manufacturing to provide electrodes on jagged portions of the film. It is expected that the degree of mirror gloss of roughness surface in example 1 of the Declaration is increased by not using Zeratin, which is not common in electrodeposited copper manufacturing, but even without Zeratin as an additive

example 1 in the Declaration does not achieve the claimed degree of mirror gloss of roughness surface. In contrast, the process provided in the specification uses polyethylene amines as an additive and, thus, the matte surface may be produced as a very smooth surface with the degree of mirror gloss of roughness surface as recited in claim 1.

As evidenced in the attached Declaration, the foils of Wolski do not have the degree of mirror gloss of roughness surface as recited in claim 1. Further, at least because Wolski is entirely silent as to this feature, it would not have been obvious for one of ordinary skill in the art to have modified either the process or product of Wolski to have attempted to have achieved the claimed degree of mirror gloss of roughness surface. Put differently, neither Wolski nor the Office Action provide any reason or rationale for one of ordinary skill in the art to have expected that he or she could or should have modified the disclosure of Wolski to have achieved the degree of mirror gloss of roughness surface as recited in claim 1. Thus, Wolski would not have rendered obvious at least this feature of claim 1.

For at least the reasons stated above, as supported by the attached Declaration, claim 1 would not have been rendered obvious by Wolski. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Declaration Under 37 C.F.R. §1.132

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